



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,895	06/23/2003	Thomas C. Anthony	10014272-1	7565

7590 07/09/2004

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

NGUYEN, DANG T

ART UNIT	PAPER NUMBER
----------	--------------

2178

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/601,895

Applicant(s)

ANTHONY, THOMAS C.

Examiner

Dang T Nguyen

Art Unit

2178

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Search history.

DETAILED ACTION

1. This action is responsive to the following communications: the Application and the Information Disclosure Statement filed on June 23, 2003.
2. Claims 1 - 23 are pending in this case. Claims 1, 15, 20, and 23 are independent claims.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter "having free magnetic poles" in claims 1 and 20. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Specification needs to provide proper antecedent basis for subject matter "having free magnetic poles" in claims 1 and 20.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 10, and 13 – 23, are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. U.S. Patent No. 6,556,473 – filed Jul. 26, 2001.

Regarding independent claim 1, Fig. 4 of Saito et al. discloses a magnetic memory array comprising: a plurality of bit cells [13's], each bit cell [13] including at least one magnetic layer (Fig. 2B [21 – 25]) having free magnetic poles ([23], Col. 7 line 45, and Col. 2 lines 65-67 of 'Saito' *disclosing a magnetic record layer 23 configured to reverse magnetization direction thereof by changing a direction of a magnetic field, thus the orientation of magnetization of magnetic record layer 23 is not fixed and capable pointing either orientations of the poles, therefore magnetic layer 13 clearly discloses a layer of free magnetic poles*) with a corresponding demagnetization field (even though *Saito et al. does not explicitly disclose demagnetization field corresponding to magnetic layer, however under Background of the invention on page 2 paragraph [0006] of application-admitted-prior-art disclosing demagnetization field is a inherent characteristics of magnetic memory array; therefore demagnetization field is inherent to magnetic memory array of Saito et al.*); and a magnetic flux absorbing layer (Fig. 2B [18], Col. 4 lines 6 – 7, Col. 4 lines 46 – 49) disposed between at least two of the plurality of bit cells (Col. 8 lines 26 – 32 "two storage cells").

Regarding dependent claim 2, Fig. 4 of Saito et al. further discloses wherein the plurality of bit cells are oriented in rows and columns.

Regarding dependent claim 3, Fig. 14A of Saito et al. discloses wherein the magnetic flux absorbing layer is disposed between at least one of the rows and the columns of the bit cells.

Regarding dependent claim 4, Saito et al. discloses wherein the magnetic flux absorbing layer is disposed between all of the plurality of bit cells (Fig. 2B[18] discloses

magnetic flux absorbing layer for each bit cell 13 of bit cell memory array in Figs. 14 and 15, therefore [18] is clearly disposed between all the plurality of bit cell 13's).

Regarding dependent claim 5, Saito et al. discloses wherein the magnetic flux absorbing layer is substantially coplanar with the plurality of bit cells (Figs. 4, 5).

Regarding dependent claim 6, Saito et al. discloses, wherein the magnetic memory array is a magnetic random access memory array (Col. 7 lines 24-25).

Regarding dependent claim 7, Saito et al. discloses wherein the magnetic flux absorbing layer (Fig. 2B [18]) is contiguous with a non-magnetic layer (Fig. 2B[19]).

Regarding dependent claim 8, Saito discloses wherein the magnetic flux absorbing layer is selected from the group consisting of iron, nickel, cobalt, alloys of iron, alloys of nickel, and alloys of cobalt (Col. 9 lines 25 – 32).

Regarding dependent claim 9, Saito et al. discloses wherein the magnetic flux absorbing layer (Fig. 2B [18]) is electrically insulating (Fig. 2B [19], Col. 7 line 40).

Regarding dependent claim 10, Saito et al. discloses wherein the electrically insulating magnetic flux absorbing layer is a ferrite (Col. 9 lines 50 – 55).

Regarding dependent claim 13, Saito et al. discloses wherein the magnetic flux absorbing layer is an amorphous metal (Col. 9 lines 28 – 30).

Regarding dependent claim 14, Saito et al. discloses wherein the bit cells are spin tunneling bit cells (Col. 4 lines 7 – 9).

Regarding independent claim 15, Fig. 4 of Saito et al. discloses a method of reducing demagnetization fields in a memory device having a plurality of magnetic bits cell (13's) comprising: depositing a magnetic flux absorbing layer (Fig. 2B [18] Col. 4

lines 6 – 7, and lines 46 – 49) at least between two bit cells of the plurality of bit cells (Col. 8 lines 26 – 32 “two storage cells”).

Regarding dependent claim 16, Saito et al. discloses wherein depositing the magnetic flux absorbing layer comprises depositing an electrically insulating magnetic flux absorbing layer (Fig. 2B [19], Col. 7 line 40).

Regarding dependent claim 17, Saito et al. discloses wherein depositing the magnetic flux absorbing layer comprises depositing material selected from the group consisting of iron, nickel, cobalt, alloys of iron, alloys of nickel, and alloys of cobalt (Col. 9 lines 25 – 32).

Regarding dependent claim 18, Saito et al. discloses wherein depositing the magnetic flux absorbing layer comprises depositing a ferromagnetic film having an isotropic response to magnetic fields (Col. 10 lines 59 – 67).

Regarding dependent claim 19, Saito et al. further discloses comprising depositing a non-magnetic layer at least between two of the bit cells (Fig. 2B [19]).

Regarding independent claim 20, the claim incorporated substantially same subject matter as claim 1 above, and is rejected along the same rationale.

Regarding dependent claim 21, the claim incorporated substantially same subject matter as claim 7 above, and rejected along the same rationale.

Regarding dependent claim 22, Saito et al. discloses wherein the magnetic flux absorbing means (Fig. 2B[18]) between adjacent bit cell is an electrical insulating soft magnetic material (Col. 9 lines 25 – 26).

Regarding independent claim 23, Figs. 4 and 5 of Saito et al. disclose an electronic system comprising: an electronic device (Figs. 4, 5); and a memory chip electrically connected to the electronic device (Figs. 4, 5), the memory chip including a memory array (Figs. 4, 5); wherein the memory array includes a plurality of bit cells (13's) and a magnetic flux absorbing layer (Fig. 2B [18], Col. 4 lines 6 – 7, Col. 4 lines 46 – 49) disposed between at least two of the plurality of bit cells (Col. 8 lines 26 – 32 "two storage cells").

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. '473' in view of Saito et al. U.S. Patent No. 6,590,803 B2 – filed Mar. 22, 2002.

Saito et al. '473' as applied to claim 1 above, disclosed every aspect of applicant's claimed invention, however the magnetic flux absorbing layer of Saito et al. does not disclose a magnetic permeability of greater than 100.

Saito et al. '803' discloses a magnetic shield for MRAM having permeability greater than 100 ('803' Col. 17 lines 53 – 63).

'473' and '803' are common subject matter of MRAM. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporated the permeability taught by '803' into '473' for the purpose of providing a desired high permeability of MRAM array, which has suggested by '473' ('473' Col. 16 lines 6 – 7).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. '473' in view of Gill et al. U.S. Patent No. 6,108,177 – filed Nov. 19, 1998.

Saito et al. '473' as applied to claim 1 above, disclosed every aspect of applicant's claimed invention, however the magnetic flux absorbing layer of Saito et al. does not disclose a coercivity of less than 10 Oersteds.

Gill discloses a magnetic flux layer having a coercivity of less than 10 Oersteds (Col. 4 lines 46 – 49).

Saito et al. '473' and Gill are common subject matter of magnetic memory cell array. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporated the coercitivity taught by Gill into Saito '473' for the purpose of providing a desired small coercitivity force for magnetic memory array, which has suggested by Saito et al. '473' ('473' Col. 9 lines 35 - 36).

Prior art

6. The prior art made of record and not relied upon is considered pertinent to

Art Unit: 2178

applicant's disclosure.

Fukuzumi Pub. No. US 2004/0105303 A1 Pub. Date: Jun. 3, 2004

Heide Pub. No. US 2004/0076036 A1 Pub. Date: Apr. 22, 2004

Goronkin et al. Patent No. US 6,525,957 B1 Date of Patent: Feb. 25, 2003

Contact Information

7. Any inquiry concerning this communication from the examiner should be directed to Dang Nguyen, who can be reached by telephone at (703) 305-1673. Normal contact times are M-F, 8-4:30.

Upon an unsuccessful attempt to contact the examiner, the examiner's supervisor, Heather Herndon, may be reached at (703) 308-5186.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 305-3900.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 746-7239 (for formal communications intended for entry)

or:

(703) 746-7238 (for after-final communications)

Art Unit: 2178

Hand-delivered responses should be brought to

Crystal Park II, 2121 Crystal Drive

Arlington, VA, Fourth Floor (receptionist).

Dang Nguyen 6/18/2004

A handwritten signature in black ink, appearing to be 'R. Elms', with a date '6/18/04' written in the lower right corner of the signature.

RICHARD ELMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800